

WHAT IS CLAIMED IS:

1
1 1. A bonding pad structure disposed on a surface of a
2 semiconductor substrate with a circuit therein, comprising:
3 a bottom metal layer disposed over the surface of the
4 semiconductor substrate to connect the circuit electrically;
5 an inter-metal dielectric layer disposed over the bottom
6 metal layer;
7 a plurality of metal plugs formed therein the inter-metal
8 dielectric layer to connect with the bottom metal layer;
9 a top metal layer disposed over the inter-metal
10 dielectric layer connecting with the metal plugs; and
11 a passivation layer disposed over the top metal layer
12 with a plurality of openings to expose the top metal layer
13 portions as bonding pads, wherein at least one bonding pad is
14 mark-shaped to indicate the orientation of the bonding pads
15 on the semiconductor substrate.

1 2. The bonding pad structure as claimed in claim 1,
2 wherein the mark-shaped bonding pad is a "⊥" shape.

1 3. The bonding pad structure as claimed in claim 1,
2 wherein the mark-shaped bonding pad is a "⊞" shape.

1 4. The bonding pad structure as claimed in claim 1,
2 wherein the mark-shaped bonding pad is a cross shape "+".

1 5. The bonding pad structure as claimed in claim 1,
2 wherein the mark-shaped bonding pad is a "⌈" shape

1 6. The bonding pad structure as claimed in claim 1,
2 wherein the top and bottom metal layers are an alloy of
3 aluminum and copper or an alloy of aluminum, copper and
4 silica.

1 7. The bonding pad structure as claimed in claim 1,
2 wherein the inter-metal dielectric layer is silicon oxide.

1 8. The bonding pad structure as claimed in claim 1,
2 wherein the passivation layer is silicon oxide or
3 borophosphosilicate glass and silicon nitride.

1 9. A probe pad on a semiconductor circuit for electric
2 characteristic measurement which has a mark-shape to indicate
3 the relative location of the probe pad on the semiconductor
4 circuit.

1 10. The probe pad as claimed in claim 9, wherein the
2 mark-shaped bonding pad is a "⏏" shape.

1 11. The probe pad as claimed in claim 9, wherein the
2 mark-shaped bonding pad is a "⏏" shape.

1 12. The probe pad as claimed in claim 9, wherein the
2 mark-shaped bonding pad is a cross shape "⦶".

1 13. The probe pad as claimed in claim 9, wherein the
2 mark-shaped bonding pad is a "⏏" shape.

1 14. The probe pad as claimed in claim 9, wherein the
2 probe pad is an alloy of aluminum and copper or an alloy of
3 aluminum, copper and silica.

1 15. A method for forming a bonding pad structure on a
2 surface of a semiconductor substrate with a circuit therein,
3 comprising:

4 disposing a bottom metal layer over the surface of the
5 semiconductor substrate to connect the circuit electrically;

6 disposing an inter-metal dielectric layer over the bottom
7 metal layer;

8 forming a plurality of metal plugs in the inter-metal
9 dielectric layer to connect with the bottom metal layer;

10 disposing a top metal layer over the inter-metal
11 dielectric layer to connect with the metal plugs;

12 disposing a passivation layer over the top metal layer;
13 and

14 defining a plurality of openings on the passivation layer
15 to expose the top metal layer portions as bonding pads,

16 wherein at least one bonding pad is defined as a mark-shape
17 to indicate the orientation of the bonding pads on the
18 semiconductor substrate.

1 16. The method as claimed as in claim 15, wherein the
2 mark-shaped bonding pad is defined as a "┐" shape.

1 17. The method as claimed as in claim 15, wherein the
2 mark-shaped bonding pad is defined as a "┘" shape.

1 18. The method as claimed as in claim 15, wherein the
2 mark-shaped bonding pad is defined as a cross shape "⊕".

1 19. The method as claimed as in claim 15, wherein the
2 mark-shaped bonding pad is defined as a "└" shape.